

What is claimed:

1. An image processing circuit, comprising:

a processor operable to,

receive a value of an original pixel of an original first video image and a  
5 value of an original pixel of an original second video image,

generate a first pixel-value component from the value of the original  
pixel of the original first video image,

generate a second pixel-value component from the value of the original  
pixel of the original second video image,

10 generate a value of a filler pixel from the first and second pixel-value  
components, and

combine the filler pixel and the original first video image to generate a  
resulting video image.

15 2. The image processing circuit of claim 1 wherein the original second  
video image follows the original first video image in a sequence of video images.

3. The image processing circuit of claim 1 wherein:

the original first video image comprises an original field; and

20 the processor is operable to generate the resulting video image by,

generating a filler field that includes the filler pixel and that is  
complimentary to the original field, and

merging the original and filler fields.

25 4. The image processing circuit of claim 1 wherein:

the original first video image comprises a first original field that includes the  
original pixel of the original first video image;

the original second video image comprises a second original field that  
includes the original pixel of the original second video image; and

30 the processor is operable to generate the resulting video image by,

generating a filler field that includes the filler pixel and that is  
complimentary to the first and second original fields, and

combining the filler field and the first original field.

5. The image processing circuit of claim 1 wherein the processor is operable to:

generate the first pixel-value component equal to the value of the original pixel  
5 of the original first video image; and

generate the second pixel-value component equal to the value of the original pixel of the original second video image,

6. The image processing circuit of claim 1 wherein the processor is further  
10 operable to:

weight the first and second pixel-value components; and

generate the value of the filler pixel from the weighted first and second pixel-value components.

7. The image processing circuit of claim 1 wherein the processor is further  
15 operable to:

generate a motion value from the values of the original pixels of the original first and second video images;

generate from the motion value first and second weighting factors;

20 generate a weighted first pixel-value component by combining the first weighting factor and the first pixel-value component;

generate a weighted second pixel-value component by combining the second weighting factor and the second pixel-value component; and

25 generate the value of the filler pixel from the weighted first and second pixel-value components.

8. An image processing circuit, comprising:

a processor operable to,

30 receive a value of an original pixel of a first original video image and a value of an original pixel of a second original video image that follows the first original video image,

generate a motion value for a first filler video image from the values of the original pixels of the first and second original video images, and

cause the motion value to indicate motion for a predetermined number of filler video images following the first filler video image if the motion value indicates motion with respect to the first filler video image.

5           9.     The image processing circuit of claim 8 wherein the processor is operable to generate the motion value equal to a difference between the values of the original pixels of the first and second original video images.

10           10.    The image processing circuit of claim 8 wherein the predetermined number equals five.

15           11.    The image processing circuit of claim 8 wherein:  
the motion value indicates motion if the motion value equals a nonzero number; and  
the processor is operable to maintain the motion value equal to a nonzero number for the predetermined number of filler video images following the first filler video image if the motion value equals a nonzero number with respect to the first filler video image.

20           12.    The image processing circuit of claim 8 wherein the processor is operable to generate the motion value by:  
generating a raw motion value for the first filler video image from the values of the original pixels of the first and second original video images; and  
filtering the raw motion value to generate the motion value.

25           13.    The image processing circuit of claim 8 wherein:  
the first original video image comprises a first original video field having a polarity; and  
the second original video image comprises a second original video field  
30   having the same polarity as the first original video field.

14.    The image processing circuit of claim 8 wherein the first original video image and the original video images following the first original video image compose

a sequence of original video images that includes the second original video image and a third original video image located between the first and second original video images.

5           15.    The image processing circuit of claim 8 wherein:

          the first original video image and the original video images following the first original video image compose a sequence of original video images that includes the second original video image and a third original video image located between the first and second original video images;

10           the first original video image comprises a first original video field having a polarity;

          the second original video image comprises a second original video field having the same polarity as the first original video field; and

          the third original video image comprises a third original video field having a  
15           polarity opposite to the polarities of the first and second original video fields.

          16.    An image processing circuit, comprising:

          a processor operable to,

          receive first and second sets of pixel values for first and second groups,  
20           respectively, of pixels in a video image;

          generate direction values from the first and second sets of pixel values for a filler pixel disposed in the video image between the first and second groups of pixels; and

          generate a value for the filler pixel based on the direction values.  
25

          17.    The image processing circuit of claim 16 wherein:

          the first and second groups of pixels each respectively include three horizontally aligned pixels;

          the pixels of the first group are vertically aligned with the respective pixels of  
30           the second group; and

          the filler pixel is vertically aligned with a center pixel of the first group and a center pixel of the second group.

18. The image processing circuit of claim 16 wherein:  
the first and second groups of pixels each respectively include left, center,  
and right horizontally aligned pixels; and  
the processor is operable to,

- 5 generate a first one of the direction values from the value of the right  
pixel of the first group and from the value of the left pixel of the second group,  
generate a second one of the direction values from the values of the  
right and center pixels of the first group and from the values of the left and  
center pixels of the second group,  
10 generate a third one of the direction values from the values of the  
center pixels of the first and second groups;  
generate a fourth one of the direction values from the values of the left  
and center pixels of the first group and from the values of the right and center  
pixels of the second group, and  
15 generate a fifth one of the direction values from the value of the left  
pixel of the first group and from the value of the right pixel of the second  
group.

19. The image processing circuit of claim 16 wherein the processor is  
20 operable to generate the value for the filler pixel from the pixel values from which the  
processor generates the smallest one of the direction values.

20. The image processing circuit of claim 16 wherein the processor is  
operable to generate the value for the filler pixel equal to the average of the pixel  
25 values from which the processor generates the smallest one of the direction values.

21. The image processing circuit of claim 16 wherein:  
the first and second groups of pixels each respectively include three  
horizontally aligned pixels;  
30 the pixels of the first group are vertically aligned with the respective pixels of  
the second group;  
the filler pixel is vertically aligned with a center pixel of the first group and a  
center pixel of the second group; and

the processor is operable to generate the value of the filler pixel equal to an average of the values of the center pixels if all of the direction values are greater than a predetermined threshold.

5           22. The image processing circuit of claim 16 wherein the processor is operable to:

generate the value for the filler pixel equal to the average of the pixel values from which the processor generates the smallest one of the direction values if the smallest direction value is less than a predetermined threshold; and

10           generate the value for the filler pixel equal to the average of predetermined ones of the pixel values if the smallest direction value is greater than the predetermined threshold.

15           23. The image processing circuit of claim 16 wherein the processor is operable to generate the direction values by calculating respective differences between pixel values in the first set and pixel values in the second set.

24. A method, comprising:

20           generating a first pixel-value component from a value of an original pixel in an first original video image;

generating a second pixel-value component from a value of an original pixel in a second original video image;

generating a value of a filler pixel from the first and second pixel-value components; and

25           generating a resulting video image by combining the filler pixel and the first original video image.

30           25. The method of claim 24 wherein the second original video image follows the first original video image in a sequence of original video images.

26. The method of claim 24 wherein:

the first original video image comprises an original field having a polarity; and the generating the resulting video image comprises,

generating a filler field that includes the filler pixel and that has a polarity opposite to the polarity of the original field, and  
combining the original and filler fields.

5           27.    The method of claim 24 wherein:

the first original video image comprises a first original field having a polarity and including the pixel of the first original video image;

the second original video image comprises a second original field having the same polarity as the first original field and including the pixel of the second original  
10 video image; and

the generating the resulting video image comprises,

generating a filler field that includes the filler pixel and that has a polarity opposite to the polarities of the first and second original fields, and  
combining the filler field and the first original field.

15

28.    The method of claim 24 wherein:

the generating the first pixel-value component comprises generating the first pixel-value component equal to the value of the original pixel of the first original video image; and

20

the generating the second pixel-value component comprises generating the second pixel-value component equal to the value of the original pixel of the second original video image.

29.    The method of claim 24, further comprising:

25

weighting the first and second pixel-value components; and

wherein the generating the value of the filler pixel comprises generating the value of the filler pixel from the weighted first and second pixel-value components.

30.    The method of claim 24, further comprising:

30

generating a motion value from the values of the pixels of the first and second original video images;

generating from the motion value first and second weighting factors;

generating a weighted first pixel-value component by combining the first weighting factor and the first pixel-value component;

generating a weighted second pixel-value component by combining the second weighting factor and the second pixel-value component; and

5        wherein the generating the value of the filler pixel comprises generating the value of the filler pixel from the weighted first and second pixel-value components.

31.    A method, comprising:

10        generating a motion value for a first filler video image from a value of a pixel in a first original video image and a value of a pixel in a second original video image; and

15        causing the motion value to indicate motion for a predetermined number of filler video images following the first filler video image if the motion value indicates motion for the first filler video image.

32.    The method of claim 31 wherein the generating the motion value comprises generating the motion value equal to a difference between the values of the pixels of the first and second original video images.

20        33.    The method of claim 31 wherein the predetermined number equals five.

25        34.    The method of claim 31 wherein the causing comprises maintaining the motion value equal to a nonzero number for the predetermined number of filler video images following the first filler video image if the motion value equals a nonzero number to indicate motion for the first filler video image.

30        35.    The method of claim 31 wherein the generating comprises:  
generating a raw motion value for the first filler video image from the values of the pixels of the first and second original video images; and  
filtering the raw motion value to generate the motion value.



36. The method of claim 31 wherein:

the first original video image and the original video images following the first original video image compose a sequence of original video images that includes the second original video image and a third original video image located between the

5 first and second original video images;

the first original video image comprises a first original video field having a polarity;

the second original video image comprises a second original video field having the same polarity as the first original video field; and

10 the third original video image comprises a third original video field having a polarity opposite to the polarities of the first and second original video fields.

37. A method, comprising:

generating direction values for a filler pixel from the values of first and second  
15 groups of pixels disposed in a video image, the filler pixel disposed in the video image between the first and second groups of pixels; and

generating a value for the filler pixel based on the direction values.

38. The method of claim 37 wherein:

20 the first and second groups of pixels each respectively include three horizontally aligned pixels;

the pixels of the first group are vertically aligned with the respective pixels of the second group; and

25 the filler pixel is vertically aligned with a center pixel of the first group and a center pixel of the second group.

39. The method of claim 37 wherein:

the first and second groups of pixels each respectively include left, center, and right horizontally aligned pixels; and

30 generating the direction values comprises,

generating a first one of the direction values from the value of the right pixel of the first group and from the value of the left pixel of the second group,

generating a second one of the direction values from the values of the right and center pixels of the first group and from the values of the left and center pixels of the second group,

5 generating a third one of the direction values from the values of the center pixels of the first and second groups,

generating a fourth one of the direction values from the values of the left and center pixels of the first group and from the values of the right and center pixels of the second group, and

10 generating a fifth one of the direction values from the value of the left pixel of the first group and from the value of the right pixel of the second group.

40. The method of claim 37 wherein the generating the value for the filler pixel comprises generating the value for the filler pixel from the pixel values used to  
15 generate the smallest one of the direction values.

41. The method of claim 37 wherein the generating the value for the filler pixel comprises generating the value for the filler pixel equal to the average of the  
20 pixel values used to generate the smallest one of the direction values.

42. The method of claim 37 wherein:

the first and second groups of pixels each respectively include three horizontally aligned pixels;

25 the pixels of the first group are vertically aligned with the respective pixels of the second group;

the filler pixel is vertically aligned with a center pixel of the first group and a center pixel of the second group; and

30 the generating the value of the filler pixel comprises generating the value of the filler pixel equal to an average of the values of the center pixels if all of the direction values are greater than a predetermined threshold.

43. The method of claim 37 wherein the generating the value for the filler pixel comprises:

generating the value for the filler pixel equal to the average of the pixel values used to generate the smallest one of the direction values if the smallest direction

5 value is less than a predetermined threshold; and

generating the value for the filler pixel equal to the average of predetermined ones of the pixel values if the smallest direction value is greater than the predetermined threshold.

10 44. The method of claim 37 wherein the generating the direction values comprises calculating respective differences between pixel values in the first set and pixel values in the second set.